

Application No.: 09/990,474
Amendment Dated: April 30, 2004
Reply to Office Action of: January 30, 2004

MTS-2700US1

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-4. (Canceled).

5. (Previously Presented) The method for forming a semiconductor device according to claim 16, in which said step f1) comprises:

depositing said second insulating film using a TEOS-CVD method utilizing TEOS activated by O₃.

6.-10. (Canceled).

11. (Currently Amended) The method for forming a semiconductor device according to claim 16, wherein said upper metal layer is an Al layer.

12. (Previously Presented) The method for forming a semiconductor device according to claim 11, wherein

said step of depositing said Al layer comprises sputtering while heating said circuit board in a temperature range of 100 to 400°C.

13. (Canceled).

14. (Previously Presented) The method for forming a semiconductor device according to claim 16, wherein

said step of forming said surface protective film comprises depositing SiN through a plasma-excitation CVD method having an RF power of 300 W or less.

15. (Canceled).

16. (Currently Amended) A method for forming a semiconductor device,

the method comprising the steps of:

- a) providing a circuit board;
 - b) forming a first insulating film at least indirectly on said circuit board;
 - c) forming a lower electrode on said first insulating film;
 - d) forming a ferroelectric film over said lower electrode;
 - e) forming an upper electrode over said ferroelectric film, said lower electrode, ferroelectric film, and said upper electrode combining to form a ferroelectric capacitor;
 - f) creating a synthetic tensile stress upon said ferroelectric capacitor by:
 - f1) forming a second insulating film over said ferroelectric capacitor;
 - f2) forming a metal wiring film over said second insulating film; and
 - f3) forming a surface protective film over said second insulating film and said metal wiring film;
- in which step f2) comprises forming the metal wiring film by:
- f2a) depositing a TiN layer as a lower metal layer;
 - f2b) heat-treating said TiN layer to create a tensile stress; and
 - f2c) depositing an upper metal layer directly on said TiN layer over said ferroelectric capacitor after step f2b.

17. (Previously Presented) The method as in claim 16, in which step f2b) comprises heat-treating said TiN layer in a temperature range of 200 to 650°C.

18. (Previously Presented) The method as in claim 17, in which in step f2b) said stress in said TiN layer changes from a compression-directional stress to an extensional directional stress.

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19. (Previously Presented) The method as in claim 16, in which in step f2b) said stress in said TiN layer changes from a compression-directional stress to an extensional directional stress.

20. (Currently Amended) The method of claim 16, in which:

step f1) comprises depositing said second insulating film using a TEOS-CVD method utilizing TEOS activated by O₃;

step f2b) comprises heat-treating said TiN layer in a temperature range of 200 to 650°C;

said upper metal layer is an Al layer; and said step of depositing said Al layer comprises sputtering while heating said circuit board in a temperature range of 100 to 400°C; and

said step of forming said surface protective film comprises depositing SiN through a plasma-excitation CVD method having an RF power of 300 W or less.

21. (Previously Presented) The method as in claim 20, in which in step f2b) said stress in said TiN layer changes from a compression-directional stress to an extensional directional stress.